

What is claimed are:

1. An optical sensing device for detecting optical features of valuable papers, comprising first and second photocouplers (5 and 6 or 9 and 10) positioned in the vicinity of and on the opposite sides of a passageway (13) for guiding the valuable paper,

each of the first and second photocouplers (5 and 6 or 9 and 10) having a light emitting element (20, 22, 30, 32) for emitting a light, and a light receiving element (21, 23, 31, 33) in the proximity to the light emitting element (20, 22, 30, 32) for selectively receiving the light from the light emitting element (20, 22, 30, 32).

2. The optical sensing device of claim 1, wherein the first photocoupler (5 or 9) comprises a first light emitting element (20 or 30) for emitting a first light of a first wavelength and a first light receiving element (21 or 31) adjacent to said first light emitting element (20 or 30);

said second photocoupler (6 or 10) comprises a second light emitting element (22 or 32) for emitting a second light of a second wavelength different from the first wavelength of the first light emitted from the first light emitting element (20 or 30), and a second light receiving element (23 or 33) adjacent to said second light emitting element (22 or 32);

the first light receiving element (21 or 31) can receive the first light reflected on the valuable paper (64) and the second light that penetrates the valuable paper (64) from the second light emitting element (22 or 32);

the second light receiving element (23 or 31) can receive the second light reflected on the valuable paper (64) and the first light that penetrates the valuable paper (64) from the first light emitting element (20 or 30).

3. The optical sensing device of claim 2, wherein one of the first and

second lights is an infrared ray, and

the other of the first and second lights has a wavelength other than wavelength of infrared ray.

4. The optical sensing device of claim 3, wherein the first and second lights are selected from the group consisting of red, green, yellow, blue and ultraviolet lights.

5. The optical sensing device of any one of claims 1 to 4, wherein the first light emitting element (20 or 30) is apposed to the first light receiving element (21 or 31) transversely to the transported direction of the valuable paper and in alignment with the second light emitting element (22 or 32) across the passageway (13); and

the second light emitting element (22 or 32) is apposed to the second light receiving element (23 or 33) transversely to the transported direction of the valuable paper in alignment with the first light emitting element (20 or 30) across the passageway (13).

6. The optical sensing device of claim 2, wherein said first and second light emitting elements (20 or 30, 22 or 32) are turned on at the different points in time from each other to prevent the first and second light receiving elements (21 or 31, 23 or 33) from simultaneously receiving the first and second lights.

7. The optical sensing device of claim 1, wherein the first photocoupler (5 or 9) is disposed in vertically spaced relation to the second photocoupler (6 or 10) across the passageway (13).

8. An optical sensing device for detecting optical features of valuable

papers, comprising first and second fourfold assemblies longitudinally arranged before and behind along a passageway (13) for guiding the transported valuable paper (64),

said first fourfold element comprising first and second photocouplers (5 and 6) positioned in the vicinity of and on the opposite sides of the passageway (13), and

said second fourfold element comprising third and fourth photocouplers (9 and 10) positioned in the vicinity of and on the opposite sides of the passageway (13),

each of said first, second, third and fourth photocouplers (5,6,9,10) having a light emitting element (20, 22, 30, 32) for emitting a light, and a light receiving element (21, 23, 31, 33) for selectively receiving the light from the light emitting element (20, 22, 30, 32) and reflected on or penetrating the valuable paper (64).

9. The optical sensing device of claim 8, wherein the first photocoupler and third photocouplers (5 and 9) are arranged in vertically spaced relation to and in alignment to respectively the second and fourth photocouplers (6 and 10).

10. The optical sensing device of claim 8 or 9, wherein said first photocoupler (5) comprises a first light emitting element (20 or 30) for emitting a first light and a first light receiving element (21 or 31) adjacent to said first light emitting element (20 or 30);

said second photocoupler (6) comprises a second light emitting element (22) for emitting a second light of the wavelength different from that of the first light, and a second light receiving element (23) adjacent to said second light emitting element (22);

the first light receiving element (21) can receive the first light

reflected on the valuable paper (64) and the second light penetrating the valuable paper (64);

the second light receiving element (23) can receive the second light reflected on the valuable paper (64) and the first light penetrating the valuable paper (64),

said third photocoupler (9) comprises a third light emitting element (30) for emitting a third light and a third light receiving element (31) adjacent to the third light emitting element (30),

said fourth photocoupler (10) comprises a fourth light emitting element (32) for emitting a fourth light of the wavelength different from that of the third light, and a fourth light receiving element (33),

the third light receiving element (31) can receive the third light reflected on the valuable paper (64) and the fourth light penetrating the valuable paper (64),

the fourth light receiving element (33) can receive the fourth light reflected on the valuable paper (64) and the third light penetrating the valuable paper (64).

11. An optical sensing device for detecting optical features of valuable papers, comprising a triplex assembly positioned in the vicinity of a passageway (13) for guiding the transported valuable paper,

the triplex assembly comprising two light emitting elements for emitting first and second lights of the different wavelength from each other, and a light receiving element for receiving the first and second lights reflected on the valuable paper (64) at the different points in time, and a case (91) for accommodating the light emitting elements and light receiving element in the fixed positions.

12. The optical sensing device of claim 11, wherein the light emitting

elements are positioned on the opposite sides of the light receiving element and in a line.

13. The optical sensing device of claim 11, wherein the light emitting elements and light receiving element are positioned at vertexes of a plane triangle.

14. An optical sensing device for detecting optical features of valuable papers, comprising first and second triplex assemblies positioned on the opposite sides of a passageway (13) for guiding the transported valuable paper,

each of the first and second triplex assemblies including at least a light emitting element for emitting a light and at least a light receiving element for receiving the light that is emitted from the light emitting element and reflected on or penetrating the valuable paper.

15. The optical sensing device of claim 14, wherein one of the first and second triplex assemblies has first and second light emitting elements for emitting first and second lights and a first light receiving element adjacent to the first and second light emitting elements,

the other of the first and second triplex assemblies has a third light emitting element for emitting a third light and second and third light receiving elements adjacent to the third light emitting element.

16. The optical sensing device of claim 15, wherein the first light receiving element receives the first and second lights reflected on the valuable paper and the third light penetrating the valuable paper,

the second light receiving element receives the first light penetrating the valuable paper and the third light reflected on the valuable paper,

the third light receiving element receives the second light penetrating the valuable paper and the third light reflected on the valuable paper.

17. The optical sensing device of claim 15, wherein at least one of the first, second and third light emitting elements produces infrared ray.

18. The optical sensing device of claim 15, wherein the first, second and third light emitting elements are turned on at the different points in time.

19. The optical sensing device of claim 15, wherein the first, second and third light emitting elements produce respectively first, second and third lights of the different wavelength.